

The 4Es of Energy

Energy Education for
Grades 4-6
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NYSERDA

**New York State Energy Research
and Development Authority**



Energy Literacy



Some species start northward march

■ CLIMATE
Continued from Page A1

experiencing some of the most rapid and severe climate change on Earth, and the impacts on the region and the globe are projected to increase substantially in the years to come.

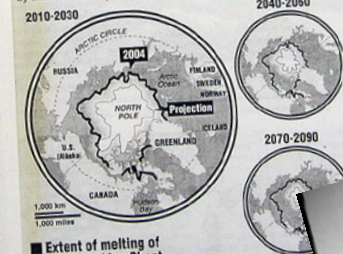
A separate report Monday by the Pew Center on Global Climate Change echoed that concern. More than 40 scientific studies, the center says, show that a variety of creatures—from

Arctic warming may drive polar bears, some seal species toward extinction

Rapid warming of Arctic

The Arctic is warming at nearly twice the rate of the rest of the globe, according to a new study.

Projected melting of Arctic summer sea ice
At least half the summer sea ice is projected to melt by the end of the century



■ Extent of melting of Greenland ice sheet projected by satellite

Projected effects
■ Rise in sea level of 23 ft. (7 m)

Study: Warming seen across U.S.

By JEFF NESMITH
OXFORD SERVICE

WASHINGTON — From Florida to Alaska and from coast to coast, nature's indicators show strong evidence of global warming in America, scientists said Monday.

A report co-authored by University of Texas biologist Camille Parmesan concluded that more than 40 scientific studies link climate change with observed ecological changes. In half of the studies, the link is strong, the report stated.

Satellite data and a century of temperature records have shown an overall increase in global temperatures to parallel the buildup of heat-trapping greenhouse gases in the atmosphere.

But in a report released by the Pew Center for Global Climate Change, Ms. Parmesan and University of Colorado ecologist Hector Galbraith say there is growing scientific evidence that now shows species trends in the

Groups vow to reverse ruling on tree felling

Politicians blamed for destruction of forests

State firm threatens wildlife sanctuary

THE NATION

STOP THE DAM, LISTEN TO THE PEOPLE

Villagers across farm of raising forest

Council ruling spells doom for forests

Forestry chief opposes Nam Choan Dam

Thai Heritage is World Heritage

Khao Laem dam took its forest toll

Country losing mangrove forest land — report

Energy Bill Could Upend Suits

By CARL HULSE

WASHINGTON, Nov. 15 — A provision of the sweeping energy bill public on Saturday that producers of a gasoline additive lawsuits was made retroactive Sept. 5, disrupting a series of lawsuits to recoup cleanup costs have been filed since then in New York, California, New Hampshire and elsewhere.

Some of the cases involving the additive, MTBE, said the kind of product has been the most used against him and others Sept. 5 date, into question then on cleanup

Arctic bearing brunt of climate changes

By MIKE TONER
THE ATLANTIC JOURNAL CONSTITUTION

Arctic regions are warming twice as fast as the rest of the world — a trend marked by melting glaciers, shrinking sea ice and climatic changes that are turning solid ground into swamps, exposing coastal villages to erosion and threatening wildlife.

Global warming may be a vague future concern for much of the world, but representatives of eight Arctic nations and six indigenous groups warned Monday that northern polar regions are the first to feel the heat.

"The impacts of global warming are apparent right now in the Arctic," said H. M. Orell, chairman of the Arctic Climate Impact Assessment.

ARCTIC CLIMATE IMPACT ASSESSMENT

NOV. 15, 2002



GLOBAL WARMING

Climbing temperatures.
Melting glaciers. Rising seas.
All over the earth we're feeling the heat.
Why isn't Washington?

OPERATIONS IN GAS WELL AT GURLEY GO RAPIDLY FORWARD

Thorough Development Of Resources of that Region to be Made

ARCTIC SLOPE WELL STRIKES OIL

PRUDHOE WELL: 1,152 BARRELS
Kennedy Hints He May Run Against LBJ

ARCTIC OIL FIND IS HUGE

2 Firms Call It One Of Biggest

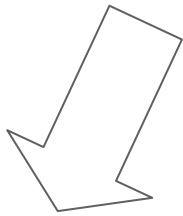


ARE THESE TOWERS SAFE?

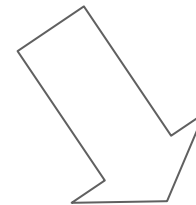
Why America's nuclear power plants are still so vulnerable to terrorist attacks — and how to make them safer — a special investigation by Mark Thompson



Energy sources fall into two categories



Renewable



Non-Renewable

Energy Sources



Non-Renewable

- Coal
- Natural Gas
- Petroleum
- Uranium

Renewable

- Biomass
- Geothermal
- Hydro
- Solar
- Wind

All have positive and negative attributes related to environmental impacts, abundance, cost, reliability, etc. **What are they?**

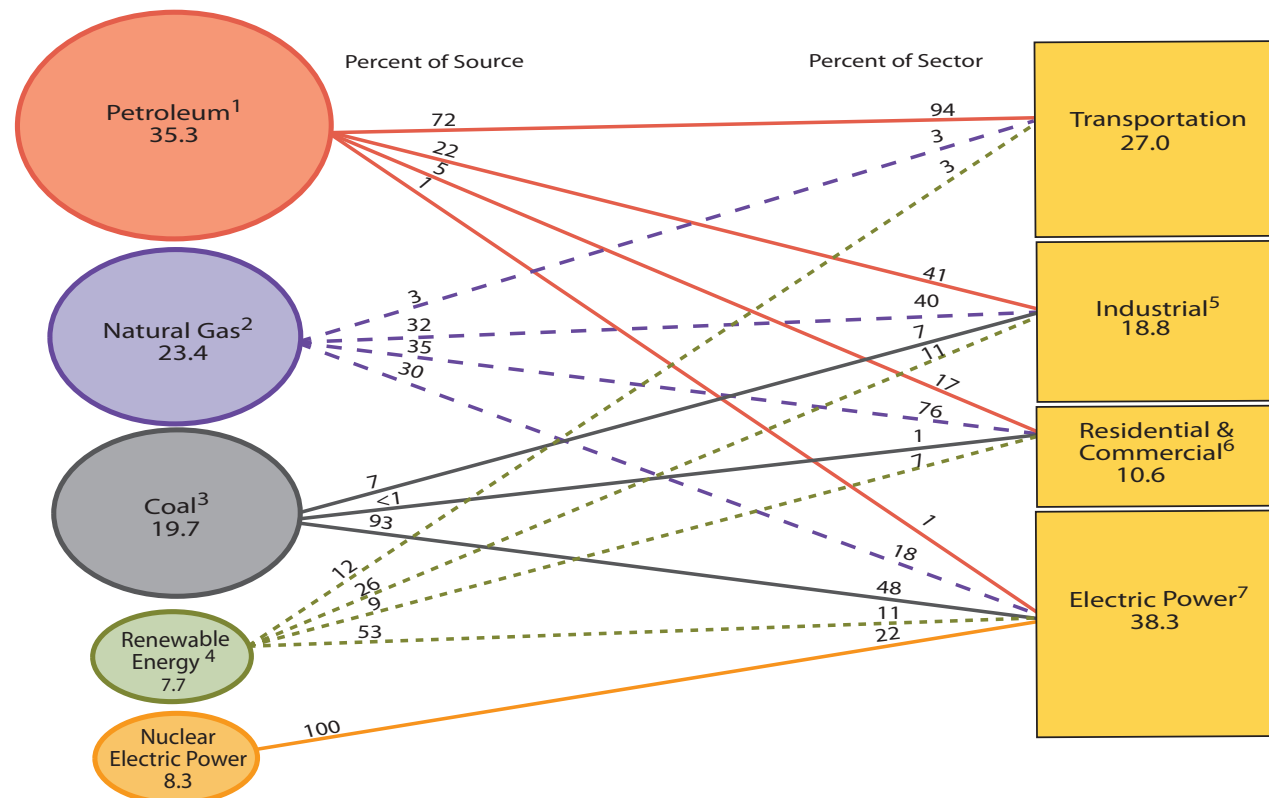
Primary Energy Consumption in the US, 2009, by Source and Sector (Quadrillion BTU)

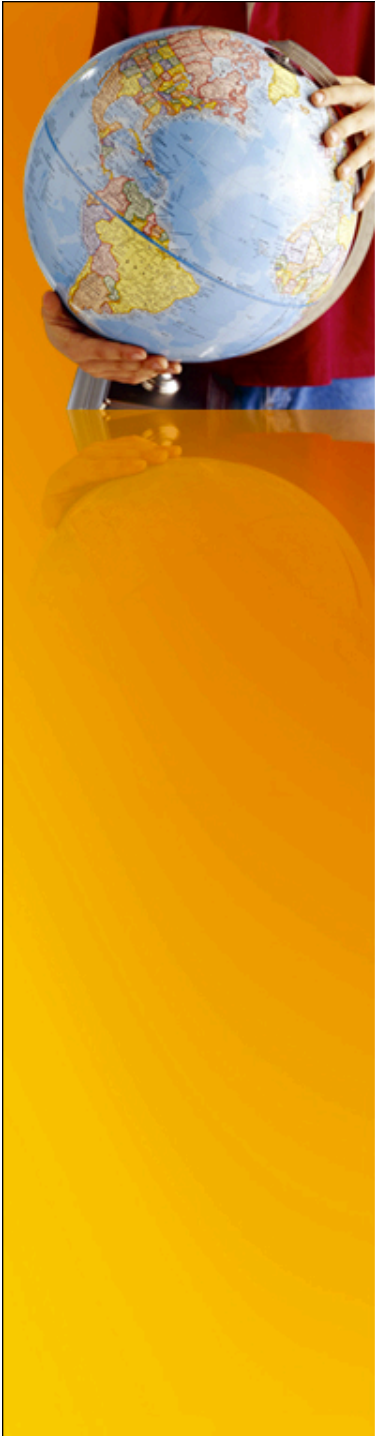


Supply Sources

Total = 94.6

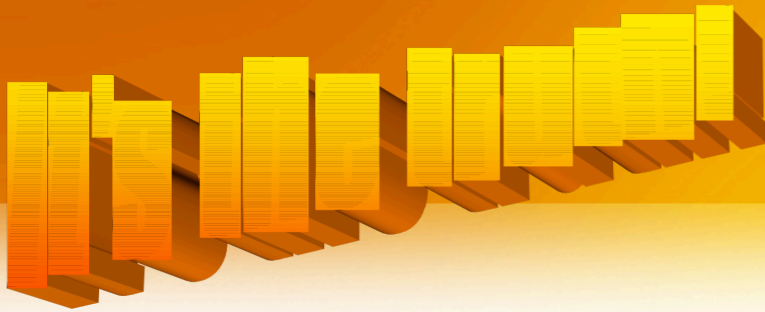
Demand Sectors





TRUE or FALSE?

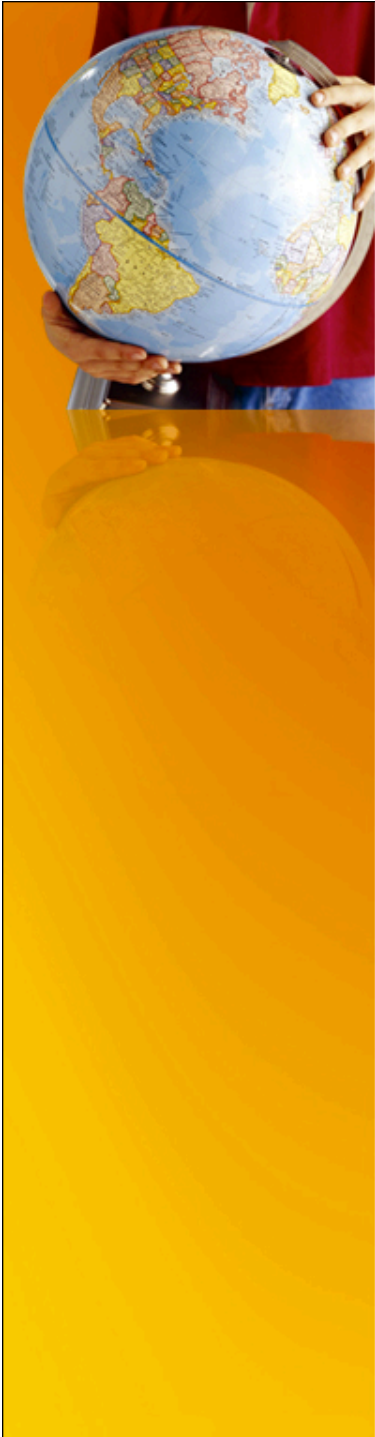
“The world’s electricity consumption is predicted to increase by 100% in the next 25 years.”



The world's electricity consumption will increase dramatically due to:

- increased world population
- increased demand in the U.S. and other developed countries
- increased demand from developing countries, such as China and India





TRUE or FALSE?

**“The U.S. consumes only
10% of the world’s oil.”**



The U.S. consumes about 23% of the world's oil.

<u>Consumption</u>	<u>Million Barrels Per Day</u>
World	85.4 million
United States	19.4 million
US in 2025 (projected)	26.1 million
New York State	0.8 million

EIA International Petroleum Monthly, May 2009, Patterns and Trends, NYSERDA



Oil Spill Math

**If we could scoop up all the oil that spilled
in the Gulf and use it, how long would it
last?**

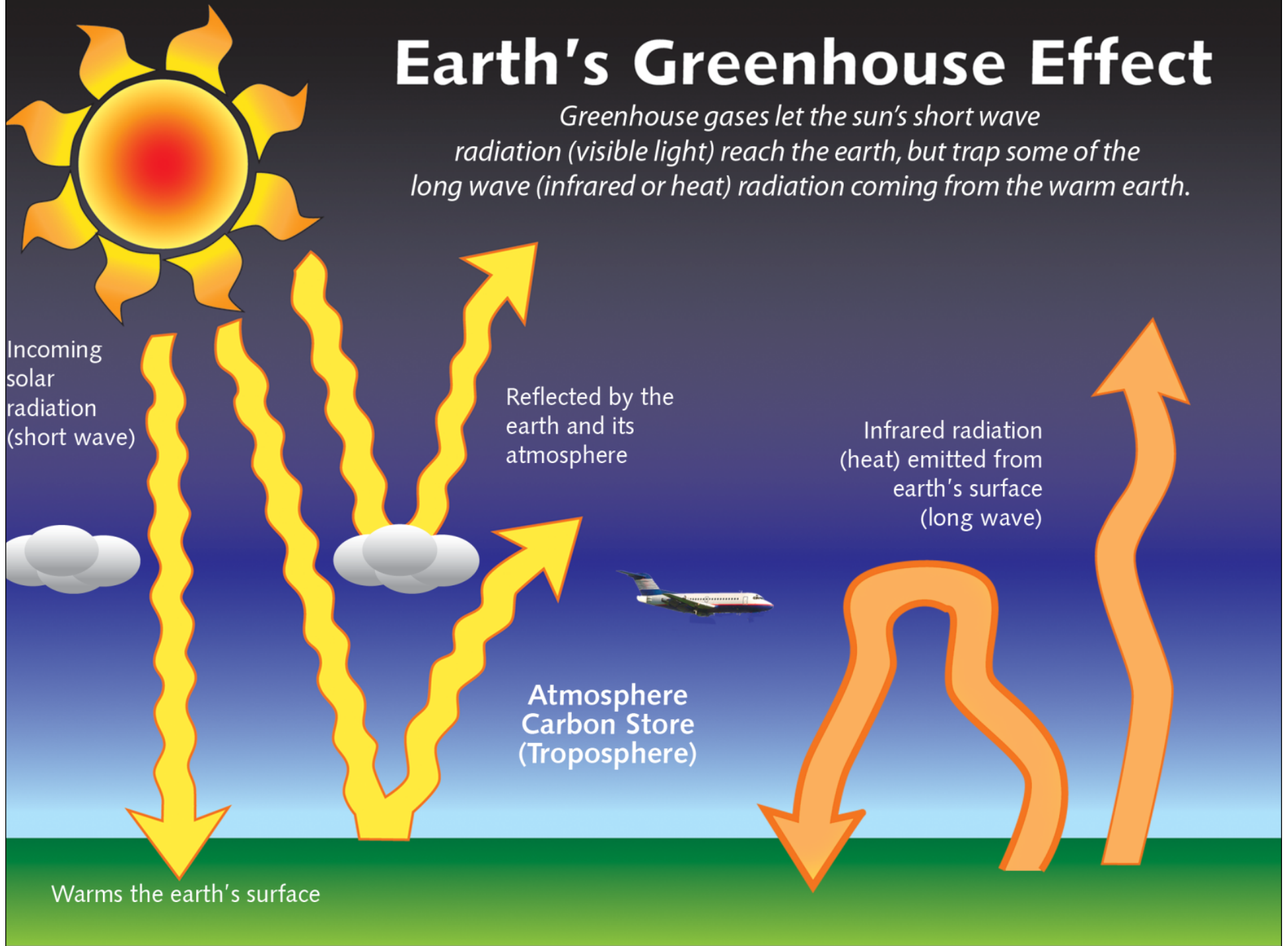


**5 million barrels of oil spilled/20 million
barrels per day =**

1/4 day, or 8 hours!!!

Earth's Greenhouse Effect

Greenhouse gases let the sun's short wave radiation (visible light) reach the earth, but trap some of the long wave (infrared or heat) radiation coming from the warm earth.



What is being done?

- Technological advances resulting in more efficient equipment and processes.
- Modest increase in fuel efficiency standards for vehicles.
- Renewable Portfolio Standard (RPS).
- Regional Greenhouse Gas Initiative (RGGI).





***“Be the
change
you want
to see
in the world.”***

Mahatma Ghandi

Search for Energy Data Sheet



Trial	Coal	Oil	Natural Gas	Uranium	Solar
1	100	4	5	30	26
2	114	0	2	12	52
3	36	0	0	5	72
4	0	0	0	0	95

Sample Graph

